

# U.S. ATLAS M&O Estimate

## WBS Profile Estimates

Funding Source: All

Funding Type: Research Program

1/24/2005 2:02:41 PM

Institutions: All

Estimate in Fixed FY'05 \$k

Labor/Material: Both

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3	<b>U.S. ATLAS M&amp;O Estimate</b>	0	0	7270	9582	9435	9307	9125	9390	9119	8451
3.1	<b>Silicon</b>	0	0	510	827	1282	1517	1372	1632	1348	910
3.1.1	<b>Pixels</b>	0	0	50	316	584	755	733	931	579	469
3.1.1.1	<b>Pre-operations</b>	0	0	0	261	126	0	0	0	0	0
3.1.1.1.1	<b>SR Building Facilities</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.1.2	<b>Mechanical support</b>	0	0	0	238	110	0	0	0	0	0
3.1.1.1.3	<b>Electrical support</b>	0	0	0	23	15	0	0	0	0	0
3.1.1.1.4	<b>Software support</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.1.5	<b>Physicist support</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.2	<b>Operations</b>	0	0	0	0	182	193	119	119	119	119
3.1.1.2.1	<b>Mechanical Support</b>	0	0	0	0	147	162	96	96	96	96
3.1.1.2.2	<b>Electrical Support</b>	0	0	0	0	36	32	23	23	23	23
3.1.1.2.3	<b>Software support</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.2.4	<b>Physicist support</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.3	<b>Maintenance</b>	0	0	50	55	276	562	614	812	460	350
3.1.1.3.1	<b>Mechanical support</b>	0	0	0	0	22	22	0	0	0	0
3.1.1.3.2	<b>Electrical support</b>	0	0	0	0	0	16	16	16	16	16
3.1.1.3.3	<b>Software support</b>	0	0	0	0	0	0	0	0	0	0

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3.1.1.3.4	<b>Physicist support</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5	<b>Spares</b>	0	0	50	55	0	0	0	0	0	0
3.1.1.3.5.1	<b>Mechanics/Services</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.2	<b>Sensors</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.3	<b>Electronics</b>	0	0	0	0	0	0	0	0	0	0
3.1.1.3.5.4	<b>Hybrids</b>	0	0	28	18	0	0	0	0	0	0
3.1.1.3.5.5	<b>Modules</b>	0	0	23	37	0	0	0	0	0	0
3.1.1.3.6	<b>B-layer Replacement</b>	0	0	0	0	254	524	598	796	444	334
3.1.1.3.6.1	<b>B-layer Replacement Mechanics</b>	0	0	0	0	0	0	0	0	83	334
3.1.1.3.6.2	<b>B-layer Replacement Sensors</b>	0	0	0	0	0	0	333	0	0	0
3.1.1.3.6.3	<b>B-layer Replace Electronics</b>	0	0	0	0	254	524	265	796	361	0
3.1.2	<b>SCT</b>	0	0	183	154	222	115	115	115	309	115
3.1.2.1	<b>Pre-operations</b>	0	0	183	154	0	0	0	0	0	0
3.1.2.1.1	<b>Preoperations - LBNL</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.1.2	<b>Preoperations - UCSC</b>	0	0	183	154	0	0	0	0	0	0
3.1.2.1.3	<b>Preoperations - SR</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.2	<b>Operations</b>	0	0	0	0	108	105	105	105	105	105
3.1.2.2.1	<b>LBNL</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.2.2	<b>UCSC</b>	0	0	0	0	108	105	105	105	105	105
3.1.2.2.3	<b>SR building/CERN</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.3	<b>Maintenance</b>	0	0	0	0	114	10	10	10	205	10
3.1.2.3.1	<b>Spares</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.3.1.2	<b>Hybrid Assembly/Test</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.3.1.2.1	<b>Hybrid Assembly/Test -LBNL</b>	0	0	0	0	0	0	0	0	0	0
3.1.2.3.1.2.2	<b>Hybrid Assembly/Test - UCSC</b>	0	0	0	0	0	0	0	0	0	0

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3.1.2.3.1.3	Module Assembly/Test	0	0	0	0	0	0	0	0	0	0
3.1.2.3.1.3.1	Module Assembly/Test - LBNL	0	0	0	0	0	0	0	0	0	0
3.1.2.3.1.3.2	Module Assembly/Test - UCSC	0	0	0	0	0	0	0	0	0	0
3.1.2.3.2	Manpower/materials	0	0	0	0	114	10	10	10	205	10
3.1.3	RODs	0	0	187	186	211	150	65	65	65	65
3.1.3.1	Pre-operations	0	0	187	186	0	0	0	0	0	0
3.1.3.1.1	Wisconsin	0	0	187	186	0	0	0	0	0	0
3.1.3.1.2	LBNL	0	0	0	0	0	0	0	0	0	0
3.1.3.1.3	Iowa State	0	0	0	0	0	0	0	0	0	0
3.1.3.2	Operations	0	0	0	0	169	108	23	23	23	23
3.1.3.2.1	Wisconsin	0	0	0	0	169	108	23	23	23	23
3.1.3.2.2	LBNL	0	0	0	0	0	0	0	0	0	0
3.1.3.2.3	Iowa State	0	0	0	0	0	0	0	0	0	0
3.1.3.3	Maintenance	0	0	0	0	42	42	42	42	42	42
3.1.3.3.1	Spares	0	0	0	0	0	0	0	0	0	0
3.1.3.3.2	Personnel/materials	0	0	0	0	42	42	42	42	42	42
3.1.4	Common Silicon/ID	0	0	90	169	265	498	460	522	395	261
3.1.4.1	Pre-operations	0	0	0	0	0	0	0	0	0	0
3.1.4.2	Maintenance Operations	0	0	90	169	265	498	460	522	395	261
3.2	TRT	0	0	570	472	359	410	391	422	358	292
3.2.1	TRT-Subsystem	0	0	525	387	227	161	161	161	161	161
3.2.1.1	TRT Pre-operations	0	0	495	327	58	0	0	0	0	0
3.2.1.1.1	Module Check( 7/02-12/04	0	0	0	0	0	0	0	0	0	0

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3.2.1.1.1.1	Technical support (Duke)	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2	equipment	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.1	gas leak tester	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.2	multi channel tension	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.3	HV breakdown test	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.4	gain mapper	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.5	HV training supplies, cables	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.2.6	storage and support	0	0	0	0	0	0	0	0	0	0
3.2.1.1.1.3	other technical support (russian)	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4	TRT-6 mod-check (2/04- 1/05)	0	0	163	0	0	0	0	0	0	0
3.2.1.1.4.1	technical support (Kline)	0	0	31	0	0	0	0	0	0	0
3.2.1.1.4.2	other technical support (Russian)	0	0	31	0	0	0	0	0	0	0
3.2.1.1.4.3	project engineer(Callahan)	0	0	48	0	0	0	0	0	0	0
3.2.1.1.4.4	electronics technician(B.	0	0	53	0	0	0	0	0	0	0
3.2.1.1.4.5	Electronics tech- Yale	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4.9	HV distribution	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4.10	Low Voltage system	0	0	0	0	0	0	0	0	0	0
3.2.1.1.4.11	system tests	0	0	0	0	0	0	0	0	0	0
3.2.1.1.5	TRT- SCT in SR (1/05 - 9/05)	0	0	332	0	0	0	0	0	0	0
3.2.1.1.5.1	technical support-Fowler	0	0	0	0	0	0	0	0	0	0
3.2.1.1.5.2	Project Engineer(Callahan)	0	0	48	0	0	0	0	0	0	0
3.2.1.1.5.3	Technical support (Kline)	0	0	55	0	0	0	0	0	0	0
3.2.1.1.5.4	Electrical Engineer(VanBerg)	0	0	90	0	0	0	0	0	0	0
3.2.1.1.5.5	system electronics tests	0	0	7	0	0	0	0	0	0	0
3.2.1.1.5.6	testing equipment	0	0	40	0	0	0	0	0	0	0
3.2.1.1.5.7	electronics tech(B. LeGeyt)	0	0	61	0	0	0	0	0	0	0
3.2.1.1.5.8	Technical support (Russian)	0	0	31	0	0	0	0	0	0	0
3.2.1.1.8	ID Integration( 10/05-4/07)	0	0	0	327	58	0	0	0	0	0

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3.2.1.1.8.1	Technical support (Duke)	0	0	0	0	0	0	0	0	0	0
3.2.1.1.8.2	Computer professional	0	0	0	79	32	0	0	0	0	0
3.2.1.1.8.3	electronics tech(B.LeGeyt)	0	0	0	57	26	0	0	0	0	0
3.2.1.1.8.4	electrical Engineer(VanBerg)	0	0	0	90	0	0	0	0	0	0
3.2.1.1.8.5	testing equipment	0	0	0	24	0	0	0	0	0	0
3.2.1.1.8.6	system tests	0	0	0	15	0	0	0	0	0	0
3.2.1.1.8.7	technical support (Russian)	0	0	0	63	0	0	0	0	0	0
3.2.1.2	Operations	0	0	0	0	75	75	75	75	75	75
3.2.1.2.1	Runtime activities	0	0	0	0	75	75	75	75	75	75
3.2.1.2.1.1	technical support (Russian)	0	0	0	0	31	31	31	31	31	31
3.2.1.2.1.3	computer professional	0	0	0	0	14	14	14	14	14	14
3.2.1.2.1.4	electronics technician	0	0	0	0	30	30	30	30	30	30
3.2.1.2.1.6	Testing equipment	0	0	0	0	0	0	0	0	0	0
3.2.1.3	TRT Maintenance	0	0	30	60	94	86	86	86	86	86
3.2.1.3.1	Shutdown maintenance activities	0	0	0	40	94	86	86	86	86	86
3.2.1.3.1.1	technical support (Russian)	0	0	0	0	31	31	31	31	31	31
3.2.1.3.1.3	Computer Professional	0	0	0	0	6	22	22	22	22	22
3.2.1.3.1.4	electronics technician	0	0	0	0	33	33	33	33	33	33
3.2.1.3.1.6	Testing equipment	0	0	0	16	16	0	0	0	0	0
3.2.1.3.1.7	Maintenance equipment	0	0	0	24	8	0	0	0	0	0
3.2.1.3.2	spares	0	0	30	20	0	0	0	0	0	0
3.2.1.3.2.4	circuit board spares	0	0	30	20	0	0	0	0	0	0
3.2.2	Common TRT/ID	0	0	45	85	132	249	230	261	197	131
3.2.2.1	Pre-Operations	0	0	0	0	0	0	0	0	0	0
3.2.2.2	Maintenance and operations (IU)	0	0	45	85	132	249	230	261	197	131
3.2.2.3	Maintenance and operations	0	0	0	0	0	0	0	0	0	0
3.3	Liquid Argon M&O Estimate	0	0	1650	1937	1777	1904	1917	1867	1875	1782

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3.3.1	<b>Mechanical Liquid Argon M&amp;O</b>	0	0	312	430	309	544	458	465	482	458
3.3.1.1	<b>Pre-operations and commissioning</b>	0	0	263	101	35	0	0	0	0	0
3.3.1.1.1	<b>Cryostat</b>	0	0	61	0	0	0	0	0	0	0
3.3.1.1.1.1	<b>Cryostat documentation update</b>	0	0	61	0	0	0	0	0	0	0
3.3.1.1.2	<b>Feedthrough</b>	0	0	49	15	0	0	0	0	0	0
3.3.1.1.2.1	<b>Signal Feedthrough</b>	0	0	24	12	0	0	0	0	0	0
3.3.1.1.2.2	<b>HV Feedthrough Documentation</b>	0	0	25	4	0	0	0	0	0	0
3.3.1.1.2.2.1	<b>HV Feedthrough Documentation</b>	0	0	0	4	0	0	0	0	0	0
3.3.1.1.2.2.2	<b>HV Feedthrough Documentation</b>	0	0	25	0	0	0	0	0	0	0
3.3.1.1.3	<b>Cryogenics</b>	0	0	150	79	35	0	0	0	0	0
3.3.1.1.3.1	<b>Cryogenics documentation</b>	0	0	4	23	17	0	0	0	0	0
3.3.1.1.3.2	<b>Cryogenics Commissioning</b>	0	0	121	48	4	0	0	0	0	0
3.3.1.1.3.3	<b>HV Feedthrough Commissioning</b>	0	0	26	7	15	0	0	0	0	0
3.3.1.1.4	<b>Forward Calorimeter</b>	0	0	3	6	0	0	0	0	0	0
3.3.1.1.4.1	<b>FCAL Documentation update</b>	0	0	3	6	0	0	0	0	0	0
3.3.1.2	<b>Operations</b>	0	0	16	186	136	284	221	229	221	221
3.3.1.2.1	<b>Cryostat</b>	0	0	0	18	7	33	41	41	41	41
3.3.1.2.1.1	<b>Cryostat operations</b>	0	0	0	18	7	33	41	41	41	41
3.3.1.2.2	<b>Feedthrough</b>	0	0	16	4	7	78	82	89	82	82
3.3.1.2.2.1	<b>Signal Feedthroughs operations</b>	0	0	5	0	0	58	62	62	62	62
3.3.1.2.2.2	<b>HV Feedthroughs operations</b>	0	0	10	4	7	20	20	28	20	20
3.3.1.2.3	<b>Cryogenics</b>	0	0	0	44	48	99	69	69	69	69
3.3.1.2.3.1	<b>Quality Meter</b>	0	0	0	0	0	51	20	20	20	20

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3.3.1.2.3.2	Cryogenics operations	0	0	0	44	48	49	49	49	49	49
3.3.1.2.4	FCAL	0	0	0	120	73	73	30	30	30	30
3.3.1.2.4.1	FCAL operations	0	0	0	120	73	73	30	30	30	30
3.3.1.3	Maintenance	0	0	33	143	138	261	237	237	261	237
3.3.1.3.1	Cryostat-Maintenance of	0	0	0	0	0	36	36	36	36	36
3.3.1.3.1.1	Maintenance of the mechanical	0	0	0	0	0	36	36	36	36	36
3.3.1.3.2	Feedthrough	0	0	0	39	6	78	53	53	78	53
3.3.1.3.2.1	Signal Feedthrough Maintenance	0	0	0	24	0	23	23	23	23	23
3.3.1.3.2.2	HV Feedthrough Maintenance	0	0	0	15	6	54	30	30	54	30
3.3.1.3.3	Cryogenics	0	0	33	98	108	124	124	124	124	124
3.3.1.3.3.1	Quality Meters	0	0	33	40	50	53	53	53	53	53
3.3.1.3.3.2	Cryogenics Maintenance	0	0	0	57	57	70	70	70	70	70
3.3.1.3.4	FCAL	0	0	0	7	24	24	24	24	24	24
3.3.1.3.4.1	FCAL	0	0	0	7	24	24	24	24	24	24
3.3.2	Electronic Liquid Argon M&O Estimate	0	0	1079	1233	1096	924	1008	954	945	945
3.3.2.1	Pre operations and Commissioning	0	0	747	646	354	0	0	0	0	0
3.3.2.1.3	System Crate Integration	0	0	502	333	202	0	0	0	0	0
3.3.2.1.3.1	Crate Documentation update	0	0	95	95	0	0	0	0	0	0
3.3.2.1.3.2	System Electronic Integration	0	0	0	0	0	0	0	0	0	0
3.3.2.1.3.3	Facilities	0	0	69	27	32	0	0	0	0	0
3.3.2.1.3.4	Systems Crate Pre-operations	0	0	142	92	30	0	0	0	0	0
3.3.2.1.3.5	System Crate pre-operations -	0	0	152	32	90	0	0	0	0	0
3.3.2.1.3.6	System Crate - Crate Burn In	0	0	44	62	37	0	0	0	0	0
3.3.2.1.3.7	Crate burn-in	0	0	0	25	12	0	0	0	0	0

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3.3.2.1.4	<b>Front End Board</b>	0	0	47	37	24	0	0	0	0	0
3.3.2.1.4.1	<b>Front End Board Documentation</b>	0	0	47	37	24	0	0	0	0	0
3.3.2.1.5	<b>Level 1 Trigger</b>	0	0	114	161	78	0	0	0	0	0
3.3.2.1.5.1	<b>Level 1 Trigger documentation</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.1.5.2	<b>System Crate pre-operations</b>	0	0	86	52	60	0	0	0	0	0
3.3.2.1.5.3	<b>FEB documentation update</b>	0	0	28	109	18	0	0	0	0	0
3.3.2.1.6	<b>ROD System</b>	0	0	85	115	50	0	0	0	0	0
3.3.2.1.6.1	<b>ROD Documentation update</b>	0	0	2	20	0	0	0	0	0	0
3.3.2.1.6.2	<b>FEB pre-operations in West Hall</b>	0	0	17	17	17	0	0	0	0	0
3.3.2.1.6.3	<b>System Crate pre-operations ROD</b>	0	0	12	25	0	0	0	0	0	0
3.3.2.1.6.4	<b>System crate Pre-operations</b>	0	0	54	53	33	0	0	0	0	0
3.3.2.2	<b>Operations</b>	0	0	305	413	373	495	522	487	483	483
3.3.2.2.1	<b>Motherboard System</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.2.2	<b>Preamp/Calibration</b>	0	0	0	0	21	21	21	21	21	21
3.3.2.2.2.1	<b>Preamp Operations</b>	0	0	0	0	21	21	21	21	21	21
3.3.2.2.2.2	<b>Calibration Operations</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.2.3	<b>System Crate</b>	0	0	285	311	287	413	401	401	401	401
3.3.2.2.3.1	<b>Readout electronics</b>	0	0	77	121	109	129	129	129	129	129
3.3.2.2.3.2	<b>Crate operations Software</b>	0	0	58	44	52	138	125	125	125	125
3.3.2.2.3.3	<b>BNL operations Physicist</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.2.3.5	<b>LAr Data Base Operation</b>	0	0	140	117	126	126	126	126	126	126
3.3.2.2.3.6	<b>SMU Data Base Operation</b>	0	0	10	28	0	21	21	21	21	21
3.3.2.2.4	<b>Front End Board</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.2.4.1	<b>FEB operations Software</b>	0	0	0	0	0	0	0	0	0	0
3.3.2.2.5	<b>Level 1 Trigger</b>	0	0	20	96	65	49	88	53	49	49
3.3.2.2.5.2	<b>Pitts operations support and</b>	0	0	0	84	33	29	68	33	29	29

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.3.2.2.5.3	Pitts operations support	0	0	20	12	32	20	20	20	20	20
3.3.2.2.5.4		0	0	0	0	0	0	0	0	0	0
3.3.2.2.6	ROD System	0	0	0	6	0	13	13	13	13	13
3.3.2.2.6.1	ROD operations Software	0	0	0	6	0	13	13	13	13	13
3.3.2.3	Maintenance	0	0	27	174	369	428	486	467	462	462
3.3.2.3.1	Motherboard System	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2	Preamps/Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2.1	Preamps/Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.2.2	Calibration	0	0	0	0	0	0	0	0	0	0
3.3.2.3.3	System Crate	0	0	27	118	335	400	434	434	434	434
3.3.2.3.3.1	Power Supply maintenance, BNL	0	0	0	91	206	169	206	206	206	206
3.3.2.3.3.2	Optical Links and system cables	0	0	0	0	0	85	82	82	82	82
3.3.2.3.3.3	Crates maintenance	0	0	0	0	41	41	41	41	41	41
3.3.2.3.3.4	DCS and monitoring	0	0	0	0	60	60	60	60	60	60
3.3.2.3.3.5	Electronics facility maintenance	0	0	27	27	27	44	44	44	44	44
3.3.2.3.4	Front End Board	0	0	0	0	0	0	0	0	0	0
3.3.2.3.4.1	Front End Readout Electronic	0	0	0	0	0	0	0	0	0	0
3.3.2.3.5	Level 1 Trigger	0	0	0	56	33	29	52	33	29	29
3.3.2.3.5.1	Level 1 trigger electronic	0	0	0	56	33	29	52	33	29	29
3.3.2.3.6	ROD System	0	0	0	0	0	0	0	0	0	0
3.3.2.3.6.2	ROD maintenance Stony Brook	0	0	0	0	0	0	0	0	0	0
3.3.3	Beam Test	0	0	127	60	106	48	48	48	48	48
3.3.3.1	FCAL Hadronic Tail Measurement	0	0	48	29	28	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.3.3.2	Test Beam - optical links	0	0	0	31	31	0	0	0	0	0
3.3.3.3	Front-end readout commissioning	0	0	14	0	0	0	0	0	0	0
3.3.3.4	Beam test equipment modification	0	0	65	0	48	48	48	48	48	48
3.3.3.4.1	Crate	0	0	21	0	0	0	0	0	0	0
3.3.3.4.2	Cooling	0	0	28	0	0	0	0	0	0	0
3.3.3.4.3	Power Supplies	0	0	16	0	0	0	0	0	0	0
3.3.3.4.4	Feedthrough	0	0	0	0	0	0	0	0	0	0
3.3.3.4.5	Mother board system	0	0	0	0	0	0	0	0	0	0
3.3.3.4.6	Beam test equipment support	0	0	0	0	48	48	48	48	48	48
3.3.4	CERN living expenses	0	0	102	102	102	102	102	102	102	102
3.3.4.1	USATLAS operation/maintenance	0	0	102	102	102	102	102	102	102	102
3.3.5	CERN common costs	0	0	30	113	163	286	302	298	298	228
3.3.5.1	CERN common costs	0	0	30	113	163	286	302	298	298	228
3.4	Tile Calorimeter	0	0	526	881	1075	717	716	715	784	715
3.4.1	TileCal - Specific Costs	0	0	351	663	923	555	555	555	623	555
3.4.1.1	Pre-Operations	0	0	351	650	220	0	0	0	0	0
3.4.1.1.1	Mechanical Support	0	0	113	134	49	0	0	0	0	0
3.4.1.1.1.1	Module Validation	0	0	33	33	0	0	0	0	0	0
3.4.1.1.1.1.1	ANL	0	0	33	33	0	0	0	0	0	0
3.4.1.1.1.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.1.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.1.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4	Integration	0	0	79	100	49	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.1.1.4.1	ANL	0	0	79	100	49	0	0	0	0	0
3.4.1.1.1.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.1.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2	Electrical Support	0	0	191	411	66	0	0	0	0	0
3.4.1.1.2.3	Validation, Repairs, and Checkout	0	0	63	141	0	0	0	0	0	0
3.4.1.1.2.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.3.2	U.Chicago	0	0	50	84	0	0	0	0	0	0
3.4.1.1.2.3.3	U. Illinois	0	0	13	42	0	0	0	0	0	0
3.4.1.1.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.3.5	UTA	0	0	0	15	0	0	0	0	0	0
3.4.1.1.2.4	Integration	0	0	40	109	0	0	0	0	0	0
3.4.1.1.2.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.2	U.Chicago	0	0	40	109	0	0	0	0	0	0
3.4.1.1.2.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5	Pre-operational testing and	0	0	87	161	66	0	0	0	0	0
3.4.1.1.2.5.1	ANL	0	0	66	105	28	0	0	0	0	0
3.4.1.1.2.5.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5.3	U. Illinois	0	0	0	30	21	0	0	0	0	0
3.4.1.1.2.5.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.2.5.5	UTA	0	0	22	25	17	0	0	0	0	0
3.4.1.1.3	Software Support	0	0	48	105	105	0	0	0	0	0
3.4.1.1.3.1	ANL	0	0	48	105	105	0	0	0	0	0
3.4.1.1.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.1.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4	Physicist Support	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.1.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2	Operations (Beam-on)	0	0	0	0	488	400	400	400	400	400
3.4.1.2.1	Mechanical Support	0	0	0	0	127	66	66	66	66	66
3.4.1.2.1.1	ANL	0	0	0	0	127	66	66	66	66	66
3.4.1.2.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2	Electrical Support	0	0	0	0	166	139	139	139	139	139
3.4.1.2.2.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.2	U.Chicago	0	0	0	0	166	139	139	139	139	139
3.4.1.2.2.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.2.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3	Software Support	0	0	0	0	196	196	196	196	196	196
3.4.1.2.3.1	ANL	0	0	0	0	114	114	114	114	114	114
3.4.1.2.3.2	U.Chicago	0	0	0	0	82	82	82	82	82	82
3.4.1.2.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.3.5	UTA	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.2.4	<b>Physicist Support</b>	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.2.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.3	<b>Maintenance (Beam-off)</b>	0	0	0	13	215	154	154	154	223	154
3.4.1.3.1	<b>Mechanical Support</b>	0	0	0	4	115	89	89	89	89	89
3.4.1.3.1.1	ANL	0	0	0	0	104	78	78	78	78	78
3.4.1.3.1.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.3.1.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.1.4	MSU	0	0	0	4	11	11	11	11	11	11
3.4.1.3.1.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2	<b>Electrical Support</b>	0	0	0	0	91	56	56	56	125	56
3.4.1.3.2.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2.2	U.Chicago	0	0	0	0	58	31	31	31	100	31
3.4.1.3.2.3	U. Illinois	0	0	0	0	18	14	14	14	14	14
3.4.1.3.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.2.5	UTA	0	0	0	0	15	12	12	12	12	12
3.4.1.3.3	<b>Software Support</b>	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4	<b>Physicist Support</b>	0	0	0	9	9	9	9	9	9	9
3.4.1.3.4.1	ANL	0	0	0	9	9	9	9	9	9	9
3.4.1.3.4.2	U.Chicago	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.4.1.3.4.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.1.3.4.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.2	Calibration & Monitoring	0	0	154	200	29	29	29	29	29	29
3.4.2.1	Pre-Operations	0	0	154	200	0	0	0	0	0	0
3.4.2.1.1	ANL	0	0	82	98	0	0	0	0	0	0
3.4.2.1.2	U.Chicago	0	0	39	39	0	0	0	0	0	0
3.4.2.1.3	U. Illinois	0	0	0	18	0	0	0	0	0	0
3.4.2.1.4	MSU	0	0	15	29	0	0	0	0	0	0
3.4.2.1.5	UTA	0	0	18	16	0	0	0	0	0	0
3.4.2.2	Operations (Beam-on)	0	0	0	0	29	29	29	29	29	29
3.4.2.2.1	ANL	0	0	0	0	29	29	29	29	29	29
3.4.2.2.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.2.2.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.2.2.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.2.2.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.2.3	Maintenance (Beam-off)	0	0	0	0	0	0	0	0	0	0
3.4.2.3.1	ANL	0	0	0	0	0	0	0	0	0	0
3.4.2.3.2	U.Chicago	0	0	0	0	0	0	0	0	0	0
3.4.2.3.3	U. Illinois	0	0	0	0	0	0	0	0	0	0
3.4.2.3.4	MSU	0	0	0	0	0	0	0	0	0	0
3.4.2.3.5	UTA	0	0	0	0	0	0	0	0	0	0
3.4.3	Tilecal System Common Costs	0	0	21	19	123	133	132	131	131	131
3.4.3.1	Operations	0	0	21	19	123	133	132	131	131	131
3.4.3.1.1	ANL	0	0	21	19	123	133	132	131	131	131
3.5	ATLAS Endcap Muon M&O	0	0	1887	1541	873	939	883	792	792	792

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.1	<b>MDT Pre-Operations, Operations and</b>	0	0	1254	1013	465	190	190	190	190	190
3.5.1.1	<b>MDT Pre-operations</b>	0	0	1254	1013	373	0	0	0	0	0
3.5.1.1.1	<b>Setup of MDT Staging and Test</b>	0	0	0	0	0	0	0	0	0	0
3.5.1.1.1.1	<b>Engineering Design of MDT Test</b>	0	0	0	0	0	0	0	0	0	0
3.5.1.1.1.1.1	<b>Michigan</b>	0	0	0	0	0	0	0	0	0	0
3.5.1.1.1.2	<b>Commission MDT Test Station</b>	0	0	0	0	0	0	0	0	0	0
3.5.1.1.1.2.1	<b>Michigan</b>	0	0	0	0	0	0	0	0	0	0
3.5.1.1.2	<b>Pre-Operations of MDT</b>	0	0	297	0	0	0	0	0	0	0
3.5.1.1.2.1	<b>Verify MDT Mechanical Integrity -</b>	0	0	92	0	0	0	0	0	0	0
3.5.1.1.2.1.1	<b>Michigan - Phase I</b>	0	0	40	0	0	0	0	0	0	0
3.5.1.1.2.1.2	<b>U. Washington/Seattle - Phase I</b>	0	0	52	0	0	0	0	0	0	0
3.5.1.1.2.2	<b>Verify MDT Chamber Electronics</b>	0	0	204	0	0	0	0	0	0	0
3.5.1.1.2.2.1	<b>Michigan - Phase I</b>	0	0	159	0	0	0	0	0	0	0
3.5.1.1.2.2.2	<b>U. Washington/Seattle - Phase I</b>	0	0	30	0	0	0	0	0	0	0
3.5.1.1.2.2.3	<b>MIT - Phase I</b>	0	0	15	0	0	0	0	0	0	0
3.5.1.1.3	<b>Pre-Operations of MDT</b>	0	0	957	435	0	0	0	0	0	0
3.5.1.1.3.1	<b>Verify MDT Mechanical Integrity -</b>	0	0	408	215	0	0	0	0	0	0
3.5.1.1.3.1.1	<b>Michigan - Phase II</b>	0	0	130	65	0	0	0	0	0	0
3.5.1.1.3.1.2	<b>U. Washington/Seattle - Phase II</b>	0	0	52	105	0	0	0	0	0	0
3.5.1.1.3.1.3	<b>Boston University - Phase II</b>	0	0	164	0	0	0	0	0	0	0
3.5.1.1.3.1.4	<b>Harvard - Phase II</b>	0	0	47	45	0	0	0	0	0	0
3.5.1.1.3.1.5	<b>MIT - Phase II</b>	0	0	15	0	0	0	0	0	0	0
3.5.1.1.3.2	<b>Verify MDT Chamber Electronics</b>	0	0	389	221	0	0	0	0	0	0
3.5.1.1.3.2.1	<b>Michigan - Phase II</b>	0	0	276	209	0	0	0	0	0	0

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3.5.1.1.3.2.2	U. Washington/Seattle - Phase II	0	0	34	12	0	0	0	0	0	0
3.5.1.1.3.2.3	Boston - Phase II	0	0	0	0	0	0	0	0	0	0
3.5.1.1.3.2.4	Harvard - Phase II	0	0	79	0	0	0	0	0	0	0
3.5.1.1.3.3	BW Single Sector Test	0	0	160	0	0	0	0	0	0	0
3.5.1.1.3.3.1	Brandeis - BW Single Sector Test	0	0	65	0	0	0	0	0	0	0
3.5.1.1.3.3.2	Michigan - BW Single Sector Test	0	0	37	0	0	0	0	0	0	0
3.5.1.1.3.3.3	U. Washington/Seattle - BW	0	0	58	0	0	0	0	0	0	0
3.5.1.1.4	Pre-Operations of MDT	0	0	0	578	373	0	0	0	0	0
3.5.1.1.4.1	Verify MDT Mechanical Integrity -	0	0	0	285	192	0	0	0	0	0
3.5.1.1.4.1.1	Brandeis University - Phase III	0	0	0	136	44	0	0	0	0	0
3.5.1.1.4.1.2	Boston University - Phase III	0	0	0	149	149	0	0	0	0	0
3.5.1.1.4.1.3	Harvard University - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.1.4	Michigan - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.1.5	U. Washington - Phase III	0	0	0	0	0	0	0	0	0	0
3.5.1.1.4.2	Verify MDT Chamber Electronics	0	0	0	293	181	0	0	0	0	0
3.5.1.1.4.2.1	Harvard University - Phase III	0	0	0	211	80	0	0	0	0	0
3.5.1.1.4.2.2	Michigan - Phase III	0	0	0	82	101	0	0	0	0	0
3.5.1.2	MDT Operations (Beam On)	0	0	0	0	92	116	116	116	116	116
3.5.1.2.1	MDT Mechanical Operations	0	0	0	0	40	52	52	52	52	52
3.5.1.2.1.1	Brandeis University	0	0	0	0	40	52	52	52	52	52
3.5.1.2.2	MDT Electronics Operations	0	0	0	0	52	64	64	64	64	64
3.5.1.2.2.1	Michigan	0	0	0	0	52	64	64	64	64	64
3.5.1.3	MDT Maintenance (Beam Off)	0	0	0	0	0	67	67	67	67	67
3.5.1.3.1	MDT Mechanical Maintenance	0	0	0	0	0	28	28	28	28	28
3.5.1.3.1.1	Brandeis University - Beam Off	0	0	0	0	0	28	28	28	28	28

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.1.3.2	<b>MDT Electronics Maintenance</b>	0	0	0	0	0	39	39	39	39	39
3.5.1.3.2.1	<b>Michigan - Beam Off</b>	0	0	0	0	0	39	39	39	39	39
3.5.1.4	<b>MDT Spares - Mechanical and</b>	0	0	0	0	0	7	7	7	7	7
3.5.1.4.1	<b>MDT Mechanical Spares</b>	0	0	0	0	0	3	3	3	3	3
3.5.1.4.1.1	<b>Harvard University</b>	0	0	0	0	0	3	3	3	3	3
3.5.1.4.2	<b>MDT Electronics Spares</b>	0	0	0	0	0	4	4	4	4	4
3.5.1.4.2.1	<b>Harvard University</b>	0	0	0	0	0	4	4	4	4	4
3.5.2	<b>CSC Pre-Operations, Operations and</b>	0	0	362	203	192	119	82	74	74	74
3.5.2.1	<b>CSC Pre-operations</b>	0	0	362	203	117	0	0	0	0	0
3.5.2.1.1	<b>Setup of CSC Staging and Test</b>	0	0	57	0	0	0	0	0	0	0
3.5.2.1.1.1	<b>Engineering Design of CSC Test</b>	0	0	22	0	0	0	0	0	0	0
3.5.2.1.1.1.1	<b>BNL</b>	0	0	15	0	0	0	0	0	0	0
3.5.2.1.1.1.2	<b>UCI</b>	0	0	7	0	0	0	0	0	0	0
3.5.2.1.1.2	<b>Commission CSC Test Station</b>	0	0	35	0	0	0	0	0	0	0
3.5.2.1.1.2.1	<b>BNL</b>	0	0	17	0	0	0	0	0	0	0
3.5.2.1.1.2.2	<b>UCI</b>	0	0	18	0	0	0	0	0	0	0
3.5.2.1.2	<b>Pre-Operations of CSC</b>	0	0	174	0	0	0	0	0	0	0
3.5.2.1.2.1	<b>Verify CSC Mechanical Integrity -</b>	0	0	55	0	0	0	0	0	0	0
3.5.2.1.2.1.1	<b>BNL - Phase I</b>	0	0	55	0	0	0	0	0	0	0
3.5.2.1.2.1.2	<b>UCI - Phase I</b>	0	0	0	0	0	0	0	0	0	0
3.5.2.1.2.2	<b>Verify CSC Chamber Electronics</b>	0	0	119	0	0	0	0	0	0	0
3.5.2.1.2.2.1	<b>BNL - Phase I</b>	0	0	87	0	0	0	0	0	0	0
3.5.2.1.2.2.2	<b>UCI - Phase I</b>	0	0	32	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.2.1.3	<b>Pre-Operations of CSC</b>	0	0	131	148	0	0	0	0	0	0
3.5.2.1.3.1	<b>Verify CSC Mechanical Integrity -</b>	0	0	13	18	0	0	0	0	0	0
3.5.2.1.3.1.1	<b>BNL - Phase II</b>	0	0	13	18	0	0	0	0	0	0
3.5.2.1.3.1.2	<b>UCI - Phase II</b>	0	0	0	0	0	0	0	0	0	0
3.5.2.1.3.2	<b>Verify CSC Chamber Electronics</b>	0	0	118	129	0	0	0	0	0	0
3.5.2.1.3.2.1	<b>BNL - Phase II</b>	0	0	63	46	0	0	0	0	0	0
3.5.2.1.3.2.2	<b>UCI - Phase II</b>	0	0	55	83	0	0	0	0	0	0
3.5.2.1.4	<b>Pre-Operations of CSC</b>	0	0	0	56	117	0	0	0	0	0
3.5.2.1.4.1	<b>Verify CSC Mechanical Integrity -</b>	0	0	0	18	11	0	0	0	0	0
3.5.2.1.4.1.1	<b>BNL - Phase III</b>	0	0	0	18	11	0	0	0	0	0
3.5.2.1.4.1.2	<b>UCI - Phase III</b>	0	0	0	0	0	0	0	0	0	0
3.5.2.1.4.2	<b>Verify CSC Chamber Electronics</b>	0	0	0	38	106	0	0	0	0	0
3.5.2.1.4.2.1	<b>BNL - Phase III</b>	0	0	0	38	74	0	0	0	0	0
3.5.2.1.4.2.2	<b>UCI - Phase III</b>	0	0	0	0	32	0	0	0	0	0
3.5.2.2	<b>CSC Operations (Beam On)</b>	0	0	0	0	75	38	38	38	38	38
3.5.2.2.1	<b>CSC Mechanical Operations</b>	0	0	0	0	14	5	5	5	5	5
3.5.2.2.1.1	<b>BNL - Beam On</b>	0	0	0	0	14	5	5	5	5	5
3.5.2.2.1.2	<b>UCI - Beam On</b>	0	0	0	0	0	0	0	0	0	0
3.5.2.2.2	<b>CSC Electronics Operations</b>	0	0	0	0	61	34	34	34	34	34
3.5.2.2.2.1	<b>BNL - Beam On</b>	0	0	0	0	29	24	24	24	24	24
3.5.2.2.2.2	<b>UCI - Beam On</b>	0	0	0	0	32	9	9	9	9	9
3.5.2.3	<b>CSC Maintenance (Beam Off)</b>	0	0	0	0	0	69	32	24	24	24
3.5.2.3.1	<b>CSC Mechanical Maintenance</b>	0	0	0	0	0	15	4	4	4	4

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.2.3.1.1	BNL - Beam Off	0	0	0	0	0	15	4	4	4	4
3.5.2.3.1.2	UCI - Beam Off	0	0	0	0	0	0	0	0	0	0
3.5.2.3.2	CSC Electronics Maintenance	0	0	0	0	0	54	28	20	20	20
3.5.2.3.2.1	BNL - Beam Off	0	0	0	0	0	22	14	11	11	11
3.5.2.3.2.2	UCI - Beam Off	0	0	0	0	0	32	14	9	9	9
3.5.2.4	CSC Spares - Mechanical and	0	0	0	0	0	12	12	12	12	12
3.5.2.4.1	CSC Mechanical Spares	0	0	0	0	0	5	5	5	5	5
3.5.2.4.1.1	BNL	0	0	0	0	0	5	5	5	5	5
3.5.2.4.2	CSC Electronics Spares	0	0	0	0	0	7	7	7	7	7
3.5.2.4.2.1	BNL	0	0	0	0	0	5	5	5	5	5
3.5.2.4.2.2	UCI	0	0	0	0	0	3	3	3	3	3
3.5.3	Alignment System Pre-Operations,	0	0	161	228	76	86	86	86	86	86
3.5.3.1	Alignment System Pre-operations	0	0	161	228	76	0	0	0	0	0
3.5.3.1.1	Pre-Ops Staging Area for	0	0	23	0	0	0	0	0	0	0
3.5.3.1.1.1	Eng. Design for Alignment	0	0	5	0	0	0	0	0	0	0
3.5.3.1.1.1.1	Brandeis	0	0	5	0	0	0	0	0	0	0
3.5.3.1.1.2	Commission Alignment Stage &	0	0	18	0	0	0	0	0	0	0
3.5.3.1.1.2.1	Brandeis	0	0	18	0	0	0	0	0	0	0
3.5.3.1.2	Pre-operations of Alignment	0	0	62	0	0	0	0	0	0	0
3.5.3.1.2.1	Brandeis - Phase I	0	0	62	0	0	0	0	0	0	0
3.5.3.1.3	Pre-operations of Alignment	0	0	77	68	0	0	0	0	0	0
3.5.3.1.3.1	Brandeis - Phase II	0	0	77	68	0	0	0	0	0	0
3.5.3.1.4	Pre-operations of Alignment -	0	0	0	160	76	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.3.1.4.1	<b>Brandeis - Phase III</b>	0	0	0	160	76	0	0	0	0	0
3.5.3.2	<b>Alignment System Operation</b>	0	0	0	0	0	19	19	19	19	19
3.5.3.2.1	<b>Brandeis</b>	0	0	0	0	0	19	19	19	19	19
3.5.3.3	<b>Alignment System Maintenance</b>	0	0	0	0	0	67	67	67	67	67
3.5.3.3.1	<b>Alignment Bars</b>	0	0	0	0	0	17	17	17	17	17
3.5.3.3.1.1	<b>Brandeis</b>	0	0	0	0	0	17	17	17	17	17
3.5.3.3.2	<b>Proximity Monitors</b>	0	0	0	0	0	16	16	16	16	16
3.5.3.3.2.1	<b>Brandeis</b>	0	0	0	0	0	16	16	16	16	16
3.5.3.3.3	<b>Multi-Point System (BCAM)</b>	0	0	0	0	0	20	20	20	20	20
3.5.3.3.3.1	<b>Brandeis</b>	0	0	0	0	0	20	20	20	20	20
3.5.3.3.4	<b>In-Plane System</b>	0	0	0	0	0	16	16	16	16	16
3.5.3.3.4.1	<b>Brandeis</b>	0	0	0	0	0	16	16	16	16	16
3.5.4	<b>Muon Endcap Common Costs</b>	0	0	46	44	88	300	306	195	195	195
3.5.4.1	<b>Engineering Coordination of</b>	0	0	0	0	0	0	0	0	0	0
3.5.4.1.1	<b>Engineering Coordination - BNL</b>	0	0	0	0	0	0	0	0	0	0
3.5.4.2	<b>Muon Endcap Common Cost</b>	0	0	46	44	88	300	306	195	195	195
3.5.4.2.1	<b>MDT Operations Common</b>	0	0	0	0	0	0	0	0	0	0
3.5.4.2.2	<b>M&amp;O(B) Common Cost - BNL</b>	0	0	46	44	88	300	306	195	195	195
3.5.4.2.3	<b>M&amp;O(B) Common Cost - MIT</b>	0	0	0	0	0	0	0	0	0	0
3.5.4.2.4	<b>C&amp;I(B) Common Cost - MIT</b>	0	0	0	0	0	0	0	0	0	0
3.5.5	<b>Monitoring &amp; Calibration</b>	0	0	65	52	52	244	218	246	246	246
3.5.5.1	<b>Monitoring and Calibration Beam</b>	0	0	52	52	52	244	218	246	246	246
3.5.5.1.1	<b>MDT M&amp;C System</b>	0	0	0	0	0	116	128	135	135	135

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.5.5.1.1.1	<b>MDT Monitoring and Calibration -</b>	0	0	0	0	0	116	128	135	135	135
3.5.5.1.2	<b>CSC M&amp;C System</b>	0	0	0	0	0	61	41	53	53	53
3.5.5.1.2.1	<b>CSC M&amp;C System Operation -</b>	0	0	0	0	0	61	41	53	53	53
3.5.5.1.3	<b>Alignment M&amp;C System</b>	0	0	0	0	0	41	35	45	45	45
3.5.5.1.3.1	<b>Alignment M&amp;C System -</b>	0	0	0	0	0	41	35	45	45	45
3.5.5.1.4	<b>Environmental Sensors M&amp;C</b>	0	0	52	52	52	26	14	14	14	14
3.5.5.1.4.1	<b>Environmental Sensor Ops - Tufts</b>	0	0	52	52	52	26	14	14	14	14
3.5.5.2	<b>Muon Test Beams</b>	0	0	13	0	0	0	0	0	0	0
3.5.5.2.1	<b>Muon Test Beam Support -</b>	0	0	0	0	0	0	0	0	0	0
3.5.5.2.2	<b>Muon Test Beam Support - BNL</b>	0	0	0	0	0	0	0	0	0	0
3.5.5.2.3	<b>Muon Test Beam Support -</b>	0	0	0	0	0	0	0	0	0	0
3.5.5.2.4	<b>Muon Test Beam UCI</b>	0	0	0	0	0	0	0	0	0	0
3.5.5.2.5	<b>Muon Test Beam - Tufts</b>	0	0	0	0	0	0	0	0	0	0
3.5.5.2.6	<b>Muon Test Beams - Stony Brook</b>	0	0	13	0	0	0	0	0	0	0
3.6	<b>Trigger/DAQ</b>	0	0	114	1007	1192	727	515	515	515	515
3.6.1	<b>Pre Operations</b>	0	0	93	130	153	59	0	0	0	0
3.6.1.1	<b>Supervisor Rol Builder</b>	0	0	46	28	15	0	0	0	0	0
3.6.1.1.1	<b>Supervisor Rol Builder - ANL</b>	0	0	36	15	15	0	0	0	0	0
3.6.1.1.2	<b>Supervisor Rol Builder - MSU</b>	0	0	10	12	0	0	0	0	0	0
3.6.1.2	<b>Communications and Travel</b>	0	0	0	0	0	0	0	0	0	0
3.6.1.2.1	<b>Communications and Travel</b>	0	0	0	0	0	0	0	0	0	0
3.6.1.2.2	<b>Communications and Travel</b>	0	0	0	0	0	0	0	0	0	0
3.6.1.3	<b>Programming Support</b>	0	0	36	103	138	59	0	0	0	0
3.6.1.3.1	<b>Programming Support - ANL</b>	0	0	36	59	52	41	0	0	0	0
3.6.1.3.2	<b>Programming Support - MSU</b>	0	0	0	44	37	19	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.6.1.3.3	Programming Support - UCI	0	0	0	0	0	0	0	0	0	0
3.6.1.3.4	Programming Support - UW	0	0	0	0	48	0	0	0	0	0
3.6.1.4	Equipment	0	0	12	0	0	0	0	0	0	0
3.6.1.4.1	Equipment ANL	0	0	5	0	0	0	0	0	0	0
3.6.1.4.2	Equipment MSU	0	0	6	0	0	0	0	0	0	0
3.6.2	Operations	0	0	21	877	1039	668	515	515	515	515
3.6.2.1	Supervisor Rol Builder	0	0	0	137	137	134	147	147	147	147
3.6.2.1.1	Supervisor Rol Builder - ANL	0	0	0	97	97	100	94	94	94	94
3.6.2.1.2	Supervisor Rol Builder - MSU	0	0	0	40	40	34	52	52	52	52
3.6.2.2	Communications and Travel	0	0	0	51	122	51	51	51	51	51
3.6.2.2.1	Communications and Travel - ANL	0	0	0	13	31	13	13	13	13	13
3.6.2.2.2	Communications and Travel -	0	0	0	13	30	13	13	13	13	13
3.6.2.2.3	Communications and Travel -	0	0	0	13	30	13	13	13	13	13
3.6.2.2.4	Communications and Travel -	0	0	0	13	30	13	13	13	13	13
3.6.2.3	Programming Support	0	0	0	668	759	462	296	296	296	296
3.6.2.3.1	Programming Support - ANL	0	0	0	248	248	135	90	90	90	90
3.6.2.3.2	Programming Support - MSU	0	0	0	90	112	75	50	50	50	50
3.6.2.3.3	Programming Support - UCI	0	0	0	205	260	145	82	82	82	82
3.6.2.3.4	Programming Support - UW	0	0	0	126	139	107	74	74	74	74
3.6.2.4	Test facilities	0	0	21	21	21	21	21	21	21	21
3.6.2.4.1	Test Facilities - ANL	0	0	10	10	10	10	10	10	10	10
3.6.2.4.2	Test Facilities - MSU	0	0	11	11	11	11	11	11	11	11
3.6.3	CERN Common Costs	0	0	0	0	0	0	0	0	0	0
3.7	Common Funds	0	0	904	1171	1129	1341	1579	1694	1694	1694
3.7.1	Common Funds (BNL)	0	0	904	1171	1129	1341	1579	1694	1694	1694
3.7.2	Common Funds (Nevis)	0	0	0	0	0	0	0	0	0	0

WBS Number	Description	FY 03 (k\$)	FY 04 (k\$)	FY 05 (k\$)	FY 06 (k\$)	FY 07 (k\$)	FY 08 (k\$)	FY 09 (k\$)	FY 10 (k\$)	FY 11 (k\$)	FY 12 (k\$)
3.8	<b>Outreach</b>	0	0	34	43	45	50	50	50	50	50
3.9	<b>Program Management</b>	0	0	224	853	853	853	853	853	853	853
3.9.1	<b>Program Management-BNL</b>	0	0	224	803	803	803	803	803	803	803
3.9.2	<b>Program Management-Nevis</b>	0	0	0	50	50	50	50	50	50	50
3.10	<b>Technical Coordination</b>	0	0	850	850	850	850	850	850	850	850
3.10.1	<b>ATLAS Access</b>	0	0	298	298	298	216	216	216	216	216
3.10.1.1	<b>Access Equipment</b>	0	0	216	216	216	216	216	216	216	216
3.10.1.2	<b>Access and Interface Beam and</b>	0	0	82	82	82	0	0	0	0	0
3.10.2	<b>Maintenance of Movement System</b>	0	0	144	144	144	144	144	144	144	144
3.10.2.1	<b>Movement System Control</b>	0	0	144	144	144	144	144	144	144	144
3.10.3	<b>Configuration Control Envelope</b>	0	0	319	319	319	319	319	319	319	319
3.10.3.1	<b>Configuration Control</b>	0	0	213	213	213	213	213	213	213	213
3.10.3.2	<b>Configuration Control @ CERN</b>	0	0	85	85	85	85	85	85	85	85
3.10.3.3	<b>EC Muons Configuration Control</b>	0	0	21	21	21	21	21	21	21	21
3.10.4	<b>Installation and Maintenance Data</b>	0	0	90	90	90	171	171	171	171	171
3.10.4.1	<b>Installation Data Base</b>	0	0	0	0	0	0	0	0	0	0
3.10.4.2	<b>Installation Data Base @ CERN</b>	0	0	90	90	90	171	171	171	171	171
3.10.5	<b>TC Project Office</b>	0	0	0	0	0	0	0	0	0	0